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ABSTRACT

Abstracts of college projects that were winners of the ninth annual Cost Reduction Incentive Awards Program are presented, including 47 programs that received monetary awards and 11 that received honorable mentions. One of the three top winners was Indiana University-Purdue University at Indianapolis, which used an ultrasound device to detect improperly functioning steam traps; the school's steam trap maintenance program saves over $285,000 annually in heating costs. Lane Community College of Eugene, Oregon, which also was a top winner, simplified a cumbersome purchase order process by issuing bank credit cards to selected staff members for material and supply purchases under $100, resulting in savings in staff time of over $118,000 a year. The third top winner, Linfield College at McMinnville, Oregon, used a spatter gun to apply topping compound to resurface badly scarred walls, particularly in residence halls marred by nail holes, dents, and old patches; permanent college employees, rather than private contractors, performed most of the labor. Other projects concerned: travel management, a library book mover, silver reflectors on existing fluorescent light fixtures, barcoding in physical plant operations, consolidation of business and student services in one area, computerized continuing education course registration, and a telephone communications and dispatching system. (SW)

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DUCTION INCENTIVE AWARDS

NACUBO/USSF

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DUCTION INCENTIVE AWARDS

The National Association of College and University Business Officers (NACUBO) and the United States Steel Foundation, Inc. (USSF) are proud to announce the winners of the ninth annual Cost Reduction Incentive Awards Program and to publish these innovative ideas. Forty-seven institutions received monetary awards ranging from $7,500 to $100. This year three ideas tied for first place and are being awarded $7,500 each. Honorable Mention awards were made to 11 institutions.

These awards recognize outstanding cost reduction programs implemented during calendar year 1983. NACUBO and USSF recognize these as worthy ideas but can offer no assurance that they will function for everyone.

The cost reduction ideas presented in this booklet are now saving money for the institutions named. While some aspects of a program may be unique to a particular institution, it is the challenge of creative administrators to tailor the programs to meet the unique requirements of their campus.

NACUBO and USSF urge you to circulate this publication to persons on your campus who have responsibility in areas such as energy, financing, personnel, computer operations, and other areas of administration mentioned herein. This booklet is intended to encourage you to make further efforts to reduce costs on your campus.

COST REDUCTION INCENTIVE AWAR

H. S. Thomson, chairman, *University of Washington*
William A. Gregory, Jr., *United States Steel Foundation, Inc.*
Thomas O. James, *Spring Hill College*
Herman D. Johnson, *University of California, San Diego*
Paul T. Knapp, *Association of Physical Plant Administrators of Colleges and Universities*
Mary M. Lai, *Long Island University*
Roger D. Lowe, *Wichita State University*
James W. White, *American Association of Community and Junior Colleges*

NACUBO
One Dupont Circle, Suite 500
Washington, D.C. 20036-1178
Telephone: 202-861-2500

Ultrasound Device to Detect Faulty Steam Traps

Indiana University-Purdue University at Indianapolis

A program was set up at Indiana University-Purdue University at Indianapolis to test annually all steam traps with an ultrasound device and to repair faulty ones. This on-going maintenance program *saves the institution $285,000 a year.*

The university estimated that it has over 2,000 steam traps, and a test showed that perhaps 50 percent were faulty. When a steam trap does not function properly, the steam passes through it and wastes heat. Visual inspection alone does not confirm proper functioning.

Four people, including a supervisor and engineer, were trained in steam trap applications, inspection, and repair. Two inspection and repair men go through each building on campus one at a time. They use an ultrasound device that looks like a hand-held gun with a probe. Held to the outlet side of the steam trap, the device records a high frequency of steam passage. In a properly functioning trap, the steam should be cycling through. If no sound is heard, the trap

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account number. A departmental budget administrator completes and signs an agreement setting forth the administrator's responsibility under the program and the conditions of use. The administrator may designate up to two people who will be authorized to use the card.

The college has a master agreement with the bank to issue credit cards. Each card represents a separate account in the college's name with a $500 monthly limit that may be adjusted. Statements for each account are sent to the college's accounts payable section at the end of the monthly billing period.

The bank sends a monthly statement for each account, but the college writes one check for the total.

The number of steps and the amount of work for the departmental financial services and purchasing services staffs have been reduced. A typical phone order using the card may require half the steps taken when a purchase order was used. The card also provides more flexibility, allows the staff to shop sales and to shop by phone, and increases the ability to respond to sudden needs. The savings are based on a estimate of a 30 percent usage of the card for purchases under $100 so that the savings could increase as more departments opt for the cards and become accustomed to using them.

Spatter Gun and Topping Compound Used to Resurface Walls

Linfield College

To resurface badly scarred walls, particularly in residence halls, Linfield College now uses topping compound applied with a spatter gun. This process covers holes, bumps, and patched areas and makes the renovation look consistent while being simple and cost-effective. The technique costs 50 to 70 percent less than alternative methods and makes the residence halls more attractive. The college puts its *annual savings at $12,000.*

Linfield made a commitment to maintaining and restoring its physical plant, including handling all remodeling and renovation with permanent college employees rather than outside contractors. The staff is encouraged to explore ways to cut costs and improve quality. One area noted for improvement was residence halls, where damage done by generations of students was hard to undo. Years of patching and repatching nail holes, chips, and dents had left unsightly bumps that also detracted from other renovation work. Workers were dissatisfied with the results of their efforts, and students lacked respect for the unsightly walls.

So Linfield experimented during the summer with topping compound applied with a spatter gun. The results were excellent. Patched, pitted, and bumpy walls were covered and had the fresh look of new construction, all at a fraction of the cost of replacing walls or covering them with new sheetrock—the two alternatives studied. For best effect, two heavy, even coats of topping compound were spattered on existing walls. Two workers can completely refinish a 22′ × 17′ room in under one and one-half hours. The technique is also used in areas of new construction.

The savings depend on the area resurfaced and the cost of alternatives. Contractors' bids put filling and sanding walls at 30 cents per square foot and installation or overlay of new sheetrock at 50 to 55 cents per square foot. Linfield's technique cost 15.5 cents per square foot.

Travel Management Program

Columbia University

Columbia University centralized its travel purchasing procedures by opening an on-campus travel office, formulating new travel policies and procedures, developing a computerized management reporting system, and creating a magnetic tape-to-tape billing system for charging all airline expenditures. This program improved service and *reduced costs over $300,000 annually.*

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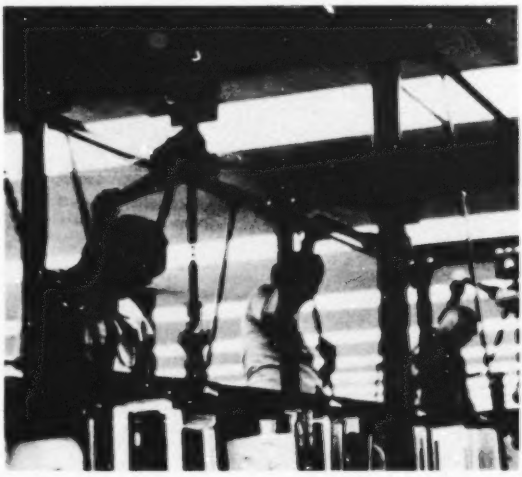

recarpeting of the library took place without workers having to physically handle any of the 50,000 volumes and *saved Cumberland County College over $5,000.*

The mechanical crane is a metal frame structure on wheels and is constructed in sections so that any six-foot section can be used for other hoisting jobs. At the top is a hoisting winch. Three of these are connected together around a book shelf range. Two parallel angle irons are bolted onto the top of the book shelves and the hoist hooks are connected. The shelves are then hoisted up into the frame, and the whole crane and shelves are usually rolled over plywood tracks to an unoccupied space.

After the new flooring is laid, the shelves are once again hoisted and rolled back. This time some positioning boards are laid over the new surface. These boards have holes in the center for the book shelf legs to fit through. The crane is rolled across the boards, the shelf is lowered, and the crane and boards are pulled away. What was estimated to be an 800 man-hour job took 96 hours. Books were kept in cataloged sequence and continued to circulate during the move. The device was developed by the superintendent of buildings and grounds as a solution to this specific problem, but it will be useful in moving other heavy, cumbersome objects.

Fluidized Bed Boilers and Cogeneration

Providence College

Providence College converted its central heating plant from oil to coal when it found a new, advanced, clean, coal-burning technology called "fluidized bed combustion." The steam that is produced is first sent through a turbine generator to provide campus electric power and is finally used to provide all campus heating and hot water.

The new technology can burn any grade of coal with any amount of sulphur content (and also any grade of oil) and still meet the most stringent current or planned air emission restrictions. Thus, the college can choose to burn whatever fuel is most cost effective.

The process burns the fuel in the presence of limestone chips that are circulated at high velocities within the boiler's combustion chamber. The sulphur in the fuel reacts with the calcium in the limestone to form calcium sulphate. This product is dispersed and disposed of with normal boiler ash, presently as landfill, though it has a marketing potential for masonry products and road-building systems.

The college also lowered steam pressure and heated many buildings with 180 degree forced hot water. This leaves more energy at the central power plant for generation of electric power, which is used on campus or sold to the local utility company. More buildings are being converted to the forced hot water heating to increase the cogeneration capabilities. *Annual savings are put at over $1,400,000.*

Silver Reflectors on Fluorescent Light Fixtures

University of California, Berkeley

The University of California at Berkeley installed silver reflectors on existing fluorescent light fixtures in labs and classrooms, permitting a one-third to one-half reduction in tubes and ballasts with a 116 percent i light reflectance and a 57 pe actual electrical energy savi *only 320 fixtures saved the $9,000 for the year*, with pot savings of over $300,000 wh fixtures are converted.

The specular silver optic highly complex technology t reflectivity with a definite i intensity, coverage, and colo polyester film is covered wi coating through vacuum me covered with an acrylic over stability and prevent corros The back is coated with a pr adhesive for permanent lam aluminum substrate. Each s custom engineered for the s the spread of light can be co specific workbench or desk

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Barcoding in Physical Plant Operations

University of Washington

Barcoding techniques are being introduced in several physical plant activities at the University of Washington to save staff time and to increase accuracy in recordkeeping. Use of barcoding in checking firefighting equipment and in timeslip/job order costing by building maintenance and alterations staff already *saves the university $172,000 annually.*

The university has a comprehensive preventive maintenance and cost accounting system that provides an extensive data base for nearly 250 buildings. But as the complexity of activities increases and the data base expands, the opportunity for errors in transcription also increases. Skilled trades employees are required to make several entries on their daily time-cards that are then put into a computer. That processing alone consumes 95 hours per day with much of the time devoted to finding errors, especially in billings to clients for recharge project work.

A barcoding pilot project for fire extinguisher inspection and control was used to familiarize the staff with the techniques and equipment. Inspection readings are simply made with a reader that is then plugged into a terminal to transfer the data to the computer. Time-cards are barcoded, with each employee given a barcoded number and all project work orders printed with a barcode ID, including building and function number. Employees simply scan their ID number, the project number, and time, all of which are directly recorded in the computer or on a tape cassette. The time saved is about 65 man-hours a day, and updated project information is available to all appropriate personnel the following day.

Carbon Dioxide Air Quality Analyzer and Controller

Central Michigan University

A carbon dioxide air quality analyzer-

controller and dampers were installed in the fieldhouse at Central Michigan University to reduce the amount of outside air needed for heating the building. The device allows the fresh air supply of a large space to be matched to the number of occupants rather than to the maximum capacity requirements. Reducing what is generally an oversupply of outside air *saves the university over $12,000 a year* in energy use in the fieldhouse.

The new system has an air quality analyzer that monitors the carbon dioxide level in the fieldhouse and starts the supply fans as different levels are reached. Shutoff dampers were installed for the supply and exhaust fans to reduce infiltration during periods when the facility is not occupied. The university found that at times of low occupancy, the fresh air brought into the fieldhouse by opening and closing doors and normal infiltration, was sufficient, and the outside air fans have not been activated. The cost of the installation was $14,000 and should pay for itself in just over a year.

Consolidation of Business and Student Services in One Area

Friends University

Friends University consolidated the business, registrar's, student financial aid, and student services offices into one area with a front counter operation that handles most of the student and employee needs for these areas. The university worked under a "downsizing is not synonymous with downgrading" philosophy and provided better service to students while reducing personnel requirements.

An ad hoc committee on downsizing recognized three areas of concern: lack of employee productivity, duplication of effort, and minimal use of student help in the support service areas. The solution to these problems was to consolidate the operations and locate them in one large room called the University Services Center with a front personnel would handle many previously handled by indivi admissions office is in anothe have a representative locate dean of students directs man operations of the center, thou supervisors are still responsi their areas. The reduction in by the consolidation *saves th $92,000 a year.*

Automated Cooli Blowdown

Louisiana State Uni

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The automated system uses a controller that measures conductivity of the water through a sensing electrode that compares it to a predetermined set point. At that point, a relay opens the bleed-off valve and fresh make-up water is introduced, lowering the concentration. The cycles of concentration can be adjusted by raising or lowering the set point. The automation reduces the need for constant manual adjustment, eliminates unnecessary water wastage, and reduces excess blowdown of treated water, thus saving chemical treatment. With *savings of over $47,000 annually*, the payback time on the system is about two and one-half months.

Dolly to Move Library Shelves

Miami University

Physical plant crews at Miami University in Ohio were charged with moving freestanding book shelf ranges in the library for carpet replacement. They devised a special dolly using rolling trailer jacks and saved approximately 14 man-hours per range moved, with *total annual savings amounting to $8,400.*

The jacks are the kind found on the front of recreational vehicles to support the tongue. This dolly consisted of two such jacks attached to either end of a welded steel framework with a clamp in the middle to attach the dolly to a vertical stack support. To move a book shelf range, it is necessary to remove the bottom two shelves on either side of a support and clamp a dolly into place every six to nine feet. The jacks are then cranked up and the whole range rolled to a new position and lowered. The jacks are inexpensive and the whole dolly can be made for about $100. Depending on labor rates, the payback would probably take place in the first four or five moves.

Eutectic Salts Off-Peak Cooling System

Orange Coast College

A revolutionary off-peak cooling system was installed at Orange Coast College using containers filled with salt hydrate materials that alternately melt and freeze in order to cool the administration building. The air conditioning system, running at night when electricity is cheaper, freezes the containers. The building is cooled during the day by passing cooling system water over the containers. *The savings on this one building are $6,400 a year.* The university is working on similar installations in other buildings.

The unique feature of the system is the eutectic salt hydrate-filled containers that freeze and melt at 47 degrees Fahrenheit. The salts are very inexpensive and are stored in polyethylene containers that stack and allow the water to flow around them. The system has some advantages over chilled water storage or ice storage systems for off-peak cooling. Less space and weight are needed to store an equivalent amount of thermal energy due to the properties of salt, and the system can be hooked up to existing chillers instead of requiring low-temperature refrigeration equipment. The building-block nature of the containers allows adaptation to any size storage requirement, and there is no problem of expansion from liquid to solid state as with ice. The salts should perform indefinitely without significant degradation.

The college received a grant from the utility company to defray the initial installation cost and will defray other installation costs by sharing the savings with the utility company.

Telephone Communications and Dispatching System

Southern Oregon State College

Southern Oregon State College installed a system that puts the capabilities of a telephone inside the hand-held radio personnel. The system als personnel of fire and burg them direct access to polic law enforcement agency. dispatchers, improves effi *$40,000 a year.*

The system was built specifications. It was devi dispatching through the lo failed and no steady fundi dispatching personnel coul device is similar to a wirel with many more capabiliti make telephone calls but burglar and fire alarms an link to local police, fire, an Automated criminal inform the field through the radio It can also be used to acti The system is suited for u custodial personnel who c and still answer a phone c operation requiring a 24-h answering capability.

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Air Conditioning System Used for Heating

Union Theological Seminary in Virginia

The adaptation of available chilled water piping and fan coil units to transmit circulating hot water at Union Theological Seminary in Virginia produced *savings* of $270,000 in capital costs and *more than $72,900 in energy and investments costs*. The new heating boiler also provided the total heating requirements for an adjacent building.

With 20 percent of the campus buildings relying on high-cost electricity for heat, a decision was made to convert to gas heat part of the married student housing complex. These apartments used fan coil units and chilled water circulation for air conditioning, while electric resistance heating elements provided the heat. Hot water came from electric hot water heaters. A review of these systems confirmed that the chilled water piping and coil units could serve as the distribution system for circulating hot water heat without a large capital outlay.

To meet specific space requirements, a new, more efficient boiler had to be located in an adjacent building but by connecting the hot water system with the other system, it was possible to heat both buildings from one boiler during the low-demand part of the heating season. Also, using the air conditioning coils provided a larger surface area than new heating coils and allowed heating at lower hot water temperatures. The domestic hot water system was also converted to gas.

Computer Assisted Retrieval File System for Personnel Records

University of Cincinnati

With the help of a microcomputer system connected to reader-printers, the University of Cincinnati was able to stop the growth of hard

copy files for employees by filming and indexing documents that could be retrieved by use of a document code. The conversion took several months—less time than the several years projected to convert on a unit-record basis to microfiche.

The new system uses a high-speed rotary camera to film up to 4,000 documents per cartridge. After the microfilm is developed, each document is viewed on a reader/printer and indexed on a microcomputer. Names, I.D. numbers, document codes, and status codes are indexed onto a floppy disk and merged into alphabetical files. Documents can be incorporated into personnel records five times faster than can hard copy, and a large backlog of filing has been eliminated. There is no need for presorting and interfiling, and overall space requirements are even less than before. Security and organization are increased because the original record never leaves the records division. Back-up copies are stored in an off-site vault. *Savings are put at $15,000 yearly and the entire filing system has been streamlined.*

Self-Insurance Programs for Parcel Shipments

University of Kentucky

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Now a group fills out a room reservation request that is reviewed to see that it complies with university guidelines. After approval, the request is entered in a personal computer by the business services office. Instant updating is obtained, and a conflict report is printed for the beginning of each day. A secretary uses the report to answer inquiries and to run a daily watch officer's report. The system has a memory of 576k and can hold 15,000 reservations at any one time.

Single-Ply Roofing Evaluation and Prequalification

University of Missouri System

The University of Missouri System, in the absence of national standards, developed single-ply roofing standard prequalification criteria and a ten-year roof system warranty. The prequalification criteria reduces staff time devoted to the preparation and review of roof specifications, and the warranty reduces replacement costs, with *total savings adding up to $57,000 annually.*

As single-ply roofing products have proliferated, the claims of manufacturers have expanded in the absence of industry standards. Building owners and designers usually rely on their own experiences and intuition in selecting roofing materials. The University of Missouri System developed reports on characteristics and limitations of major material groups and the important criteria for selection of single-ply membrane systems. It also wrote its own roof system warranty that covers the entire system, including membrane, insulation, adhesives, and fasteners. Finally, a systematic prequalification procedure for the evaluation of manufacturers and systems was developed. This includes the minimum criteria that manufacturers must meet before their roofing systems are approved by the university.

Cogeneration of Steam with Electrical Generator

University of Richmond

To reduce summer peak demand for electricity, the University of Richmond installed a cogeneration system that uses a natural gas-powered engine generator with a waste heat recovery boiler that produces steam to run an absorption chiller for air conditioning. This allows an electric chiller to be shut off and results in a *net savings of more than $128,000 annually.*

The university found that, even after a comprehensive energy conservation program was in place, its peak demand for electricity for a four-month summer period was 1,000 kilowatts higher than the actual demand for the rest of the year and increased overall electrical costs. To reduce the demand, a 720 kw natural gas-powered engine generator was put in place with the waste heat going through a recovery boiler that generated steam for an absorption chiller. With that chiller handling the air conditioning, an electric chiller, which costs 80 percent more to operate at current rates, could be shut down. Total demand reduction from the gas generator and the absorption chiller exceeds 1,000 kw. The absorption chiller can also be operated from the central steam plant when the generator is not in operation, and the waste heat from the generator can provide heat to a large building in winter if necessary. The system operates at approximately 90 percent efficiency any time it is used.

Advanced Mail Services System Computerization

University of Southern California

The University of Southern California implemented two major advanced computerization projects in its mailing services department that resulted in a *net annual savings of over $42,000.* Processing of outgoing mail was improved with equipment that performed postage accoun postage costs to departme first-class presorting and portion of incoming mail.

This state-of-the-art e scale postal system consis console/deck units with d Each console unit has a b with all postal rate and c on video display. The syst postage accounting on an electronically transmits d reports to the central fin monthly chargeback of po using departments. The s time spent on the process and the recording of post percent and the time spe accounting and financial r A sorting system that pre and sorts incoming mail v mail codes was also install increased volume of inco managed without increasi staff.

Conversion to Generated Micr Reports

Community Colle Allegheny Count

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Computer-
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The Community College of Allegheny County *saves over $140,000 annually* through the conversion of reporting media from paper to computer output microfiche. Conversion to microfiche has resolved the problem of handling reports and has improved access to the information. Before the conversion many reports were produced in up to 24 copies for distribution and delivered in cases to the appropriate offices. Now the same data can be sent in an interoffice envelope.

The data center computer produces a tape that is sent to the microfiche service bureau, which returns completed fiche of reports such as registration, general ledger, and accounts payable. Using the service bureau and available fiche readers avoids the cost of purchasing converting equipment. Advantages are the lower cost of fiche, easier access to data, reduced storage cost for filing, and faster production of reports.

Helium Recovery System

Cornell University

The laboratory of nuclear studies at Cornell University, which uses quantities of liquid and gaseous helium for its research in superconductivity, can now collect, transport, purify, and reliquify 80 percent of the helium for reuse. The formerly wasted gas is collected at one research building and pumped by compressors through one mile of nylon tubing to helium refrigerators at a second research site, where it is then purified and reliquified before being transported back for reuse. The nylon tubing, serving as a helium gasline, was placed in an underground communication conduit connecting the two research sites. The entire collection system is automated and controlled by a microprocessor.

The system makes use of existing compressors, storage tanks, refrigerators, and underground telephone conduits at little additional cost. *Annual savings realized are $81,000.*

Use of Football Stadium Press Box for Telethons

Duke University

Telethons at Duke University used to be limited in scope and frequency because of inadequate space and the high cost of installing telephone equipment. Now the university *saves over $97,000 annually* by using its press box at the football stadium for telethons. The press box was selected as a semi-permanent site because it is seldom used and is equipped with permanent and elaborate telecommunications facilities designed to serve the press. The only cost involved is $50 per event to plug in and check out the 45 telephones needed to conduct the telethon. With this location the number of telethons has increased as has annual giving.

Computerized Child Care Record and Billing System

Edmonds Community College

At Edmonds Community College, the recordkeeping system for the campus child-care center required extensive time invested by staff members and the director, taking them away from the primary task of serving children. A computerized recordkeeping and billing system was developed for the center, eliminating most of the manual recordkeeping formerly required. An additional cost-saving factor was the installation of a time clock, which freed teachers from the need to record manually the time in/time out of each child. Many of the services are paid for on an hourly basis—the combination of a time clock and billing system have improved accuracy and reduced staff time spent on monthly billings. The system makes it easier to produce reports for federal and state funding sources and provides the school with *an annual savings of almost $4,000.*

Computerized
Education Cou
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Community Coll

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Compressed Wood Fiber Gym Floor

Indiana Institute of Technology

Indiana Institute of Technology realized an *annual savings of over $14,000* by installing a new kind of floor in a gym built in 1907. The old, badly warped, and "dead" spotted gym floor had deteriorated to the point where it was no longer usable. Faced with building a new facility, renting facilities in other locations in town, or replacing the floor at a minimum investment, the institute chose to experiment with a compressed wood fiber floor that had never been used as a gym floor.

This type of floor is durable (it has survived two floodings without warping), has a low installation cost (the existing floor was left in place), and can be painted any color. The floor allows continued use of the building until a new facility can be built.

Conversion of Abandoned Water Tank for Storage

Indiana University

An abandoned municipal water tank acquired by Indiana University was rehabilitated and converted into an equipment warehouse. Renovation costs were minimized since the reinforced concrete tank was located at ground level adjacent to an asphalt service drive. To provide access, part of the earth berm that surrounds the four walls was removed and a large access door was cut through the walls, which are one-foot thick. Ventilation was provided by installing power roof ventilators in two of the four existing roof access hatches, high pressure sodium lighting was installed, and sediment was thoroughly removed from the interior of the tank. A structure that initially was to cost the university over $75,000 to demolish has now become a very valuable asset, *saving the school $482,000 in new construction costs.*

Two-Way Envelopes for Billings

Indiana University of Pennsylvania

Students at Indiana University of Pennsylvania are encouraged to mail their university bill payments to a lock-box system. Previously, billing statements mailed to students included a self-addressed return envelope to insure that payments were returned to the lock-box address for quick depositing.

Now the university has instituted the "two-way" envelope. The original envelope mailed to the student can be used by the student for mailing his or her payment back to the school, resulting in savings on the production and printing of a second envelope, on the labor and time spent stuffing, and on the postage costs of material sent to the student. These *savings amount to $2,000 annually.*

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ent of the gas cylinder rdination of the ordering s. All orders for specialty e purchasing department. ry vendor delivers to riving to each delivery a university staff member cord of cylinders . Data from the delivery a microcomputer file record containing number, location, date received, and other information. At any time the staff is able to get a printout by any of the file record variables. The results are *an annual savings of $24,000.*

College Center Cooperative Financing Project

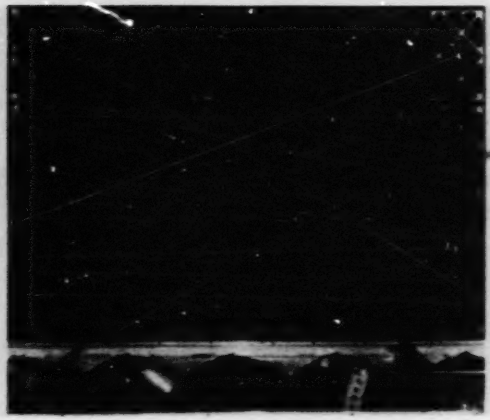
Moraine Valley Community College

Moraine Valley Community College built a college center to meet the matriculation and extra-curricular needs of its rapidly growing student body with minimal drain on existing resources. The center has revenue-generating capabilities to defray operation and maintenance costs. Financing was done through an industrial revenue bond lease agreement between the city and the college. The city issued the bonds and delivered the proceeds to the college in return for title to the land on which the center is constructed. Revenue to defray operation and maintenance costs were met by a cooperative agreement with a fast-food chain to construct and run a restaurant in the center in exchange for a percentage of gross sales. The center provides the college with *an annual savings of almost $440,000.*

Outdoor Air Damper Control

New Mexico State University

Dust entering New Mexico State University buildings from storms is controlled by outside air dampers, greatly extending filter life and keeping buildings and equipment cleaner. Wind speed is measured by a weather station tied into the campus energy management and control system. When the wind speed exceeds 20 mph, the system's switches override local economizer control of air dampers and close the outdoor air dampers to minimum positions. This limits the amount of dust drawn into the buildings. In addition to a generally cleaner



interior environment, other benefits are better performance of equipment (heat transfer), reduced wear on moving equipment, and fewer filter changes. This results in *savings of $20,000 per year for the university.*

Water and Heat Recovery

Plymouth State College

Plymouth State College uses per year over three million gallons of city drinking water, which is highly alkaline and destructive to plumbing, to cool its compressors in the dining hall. The waste water has been discharged into the city sanitary sewer system. The city was in the process of constructing a new sewage plant and was anxious for the college to stop using domestic, treated water for cooling its compressors. The college was required by the city to seek alternatives.

After review, engineers developed a system that saves energy and water by introducing the previously wasted water into the college's condensate return lines for use by the central boiler system as preheated make-up water. The switching units in the compressor were modified to reduce water flow and raise the temperature to a degree sufficient for make-up water. Water conditioning equipment was also installed to lessen pipe damage. The *annual savings are almost $9,000.*

A New Approac
Selecting Comp
Records

Purdue Universit

The development of a intensive selection progra Purdue University's deve offices provided the unive *$21,000 in savings per yea* method of selecting name from a computer file was ago, and the doubling of t over the years caused the and more slowly.

With the new approac program was created for and addresses, using a ge selection logic and tabled selection criteria. A COB from the order selection c handles the uniqueness an approach reduced comput percent and greatly increa flexibility, and maintainab

Computerized
Dosimetry and
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Rensselaer Polyte Institute

Personnel of the office nuclear safety at Renssela Institute have developed radiation dosimetry syste radioactive materials inve program computerizes the for over 250 students, facu work in radiation areas bo It also maintains an invent materials on campus.

The program is on the It performs complete data functions and provides acc

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departments and individuals. The entire program is user-oriented and completely menu-driven for ease of use. The program also tracks decaying isotopes and totals inventory for licensing requirements. The system *saves the institute $24,000 annually.*

Modification of Air-Handling Equipment

Rio Hondo Community College

Rio Hondo Community College was able to shut down its hot-static dampers to a minimum position and thereby reduce circulation to less than 5 percent in the hot-air supply duct on the double-duct system during the summer months. The adjustment was made on four of the college's air handlers and cut down on the leakage of hot air into the air conditioning system.

It was determined that there was an 18 to 27 percent leakage factor in the double-duct system that allowed over 76,000 cubic feet per minute of hot air to dilute the cooling air. Shutting down the hot-air duct dampers also reduced the running time of the electrical blower fans, and *total yearly savings are over $16,000.*

Science Greenhouse Insulation

St. Francis College

By insulating its science greenhouse, St. Francis College reduced heat loss greatly and still maintained adequate light levels. The aluminum frame structure is attached to the south side of a building and has double-strength glass in the side walls and plexiglass in the roof. Heating is by perimeter steam radiation from an electric steam boiler located in the main building.

The insulating material also must allow sufficient light and solar transmission. The material selected was an extruded double-wall polycarbonate sheet of plexiglass that was

installed in the total interior, resulting in a triple glazing of the structure. The material provides 80 percent white light transmission and 77 percent solar transmission, and has a U factor of .62. *Annual savings are over $1,400.*

On-Farm Methane Generator System

SUNY Agricultural and Technical College at Canton

A methane generator system at SUNY Agricultural and Technical College at Canton *saves the college over $4,900 per year.* The system consists of a reception pit, an anaerobic digester, a control building, gas-handling equipment, an electrical generator unit, and a manure storage facility—all designed to collect biogas from anaerobic fermentation of organic matter and to then oxidize the gas in a generator unit that produces electricity to operate the college farm.

Private Development of Residence Halls and a Dining Facility

Towson State University

Lack of on-campus housing was a problem at Towson State University, where only about 1,200 students out of an enrollment of 10,000 could be accommodated. Many students officially admitted to Towson had chosen not to attend simply because no on-campus housing was available.

Unable to obtain state funding for an additional 1,700 beds and a dining hall, the university entered into a lease-leaseback agreement with a private developer to build the facilities. The developer owned adjacent land that was donated to the university and then subdivided and leased to five limited partnerships. Each partnership developed the facilities under university specifications. The university rents the facilities at a rate that

offsets the land rents paid by
The project was financed by
development bonds and care
IRS requirements. *Savings*
annually over the 30-year li

Replacement of
Soap Dispensers
Cartridge Dispen

Tufts University

Liquid soap dispensers l
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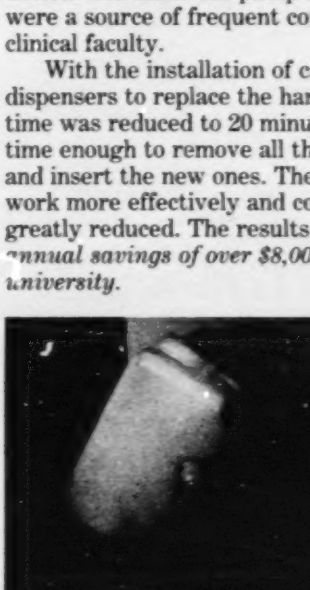
university.



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Partial Telephone Self-Maintenance

University of Central Florida

The University of Central Florida selected a partial self-maintenance program for its phone system, resulting in *an annual savings of almost $16,000 for the university.*

In this program the vendor maintains the complicated, expensive switch and cable, and the university maintains the labor-intensive telephone sets, using a student assistant as the service person. Full self-maintenance would have required a full-time technician and a large spare parts inventory and in any case there are few set failures. The student assistant maintains an inventory of phone sets and related items and helps with operator and clerical duties in the telecommunications office. In the past the office had always had a student assistant operator as backup for vacations and illness, so this reassignment of duties did not increase expenditures.

Early Intervention in Unemployment and Worker's Compensation Cases

University of Southern Maine

By intervening early with counseling, rehabilitative, and employment services, the University of Southern Maine found that many cases of chronic unemployment can be alleviated and the expense of worker's compensation prevented.

As soon as a university employee begins to collect either benefit, a consultant from the university's employee consultation and outreach service contacts the person to find out what kind of assistance may be needed. The consultant offers counseling, rehabilitation, retraining, job restructuring, or assistance in finding suitable employment elsewhere. Early intervention increases the chances of success. *The savings in compensation and unemployment costs are almost $36,000.*

Menu Pre-Costing System for Food Services

University of Tennessee at Martin

The menu pre-costing system at the University of Tennessee at Martin both improves the quality of food served and reduces costs. The project produces *an annual savings to the university of almost $34,000.*

The food services department, with assistance from the computer center, found and purchased a software package that expedites quantitative analysis of inventories, expenditures, account balances, and other areas in the food service industry. This package allows the department to enter all its recipes into a file. Tighter inventory controls and a more accurate pricing base now exist. Instructors in home economics also use the package as an aid in their food systems management courses.

Greenhouse Energy Conservation

University of Vermont

Annual energy usage by the University of Vermont's agricultural science greenhouse was changed with a multi-approach building modification program that resulted in *annual energy savings of over $10,000.*

Certain contiguous buildings erected at various times have high infiltration rates and a wasteful heating system. The need for a controlled environment in which horticultural research can be performed rendered unsuitable many commercial energy conservation measures such as double glazing or plastic envelopes. Instead, the following energy conservation modifications were accomplished: building wall insulation where allowable, perimeter below-grade insulation, mechanical systems insulation, incorporation of thermal mass into the building structure, and redesign of the temperature control system to provide more accurate and even control.

Ice Storage Off Cooling System

Ursinus College

Ursinus College, wish steam absorption chiller, system with off-peak oper cooled reciprocating unit of air conditioning. The sy ice storage compartment compressors. The compre an energy management sy compressors to operate du morning the chilled water circulating the chilled wat box into the cooling coils building.

The reduction in dayti steam production *saves th annually.* In areas where apply, the cost effectivene

Computer Term Service

West Virginia Uni

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Steam Turbine Powering of Central Heating Plant Fans and Pump

Miami University

At the central heating plant of Miami University in Ohio, steam-driven turbine units were added to the existing electric-driven fans and pump in order to make use of inexpensive steam instead of very expensive electricity for operating. The electric drives are still in place and are available as standby devices. Changes from one source of power to another are accomplished by the use of slip clutches. *Savings are $65,000 a year.*

Water Retention Structure and Irrigation System

Miami University

Miami University of Ohio designed and constructed an underground water retention structure to collect and store surface water runoff to irrigate eight athletic fields. This structure, coupled with a pumping facility and irrigation system, provides an independent source of water (conserving limited city water supplies), reduces grounds maintenance costs, and aids in maintaining high-quality, natural-turf fields. *Savings are $12,000 a year.*

Contracting for Presorting of Mail

University of Central Florida

The volume of mail at the University of Central Flordia is too low to justify sorting equipment and too high to allow manual sorting to achieve the three-cent discount per piece of presorted mail. So the university contracted with a vendor to do the sorting and share the discount. Having made no expenditures of its own to implement the system, the university achieves *an annual savings of $6,000.*

Automated Letter-of-Credit File Information System

University of Central Florida

The University of Central Florida developed a word processing system to keep track of letter-of-credit files under the Federal Reserve Bank System. The system has provided the university with a *yearly savings of over $7,000.* Information on awards, cash drawdown, budget and cash balances, and other areas can be obtained efficiently from summary reports. The principal benefit is to ease cash drawdown from the various agencies of the federal government.

Long Distance Toll Cost Reduction

University of Missouri

A cost reduction of nearly 50 percent was realized for cooperative extension personnel calling long distance to the University of Missouri-Columbia campus this past year, resulting in *an annual savings of over $39,000 for the university.* The cost reduction is due to the use of a novel combination of intrastate inward WATS and the external access feature of the stand-alone long distance toll routing switch. Field personnel call the 800 number, the toll routing switch answers, the agent enters his or her authorization number as if calling from home, he or she then dials the desired campus number.

Innovative Uses of Financial Management Systems

University of Missouri

The University of Missouri *saves $280,000 annually* using several methods for economizing in its business operations. These methods use the latest automated technologies to integrate the relationshi of financial management sy indexing/inquiry programs recording/application of cre a-week check writing.

Using Volunteer University Prog

University of Sout

Volunteers from the pr recruited to give their time expand and improve acade programs at the University The rewards have been sub volunteers and the universi *the university have to ale* The program was develope volunteer and includes pers group and profession who t funds, and program, among

Grease Fittings Classroom Chai

University of Wash

The University of Wash grease fittings on the stem mounted, swivel-type class periodic lubrication easier damage and breakage that decline of maintenance. The *annual savings of almost university.*

Used Automobil Lawnmower Rol

University of Wash

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of Washington decided to explore alternatives. A retired machinery mechanic developed the idea to make the rollers from "donuts" punched out of used automobile tires. *The annual savings are $3,200.*

PCB Leak Control
University of Washington

In order to control the leakage of PCBs (polychlorinated biphenyls) from its electrical equipment, the University of Washington had its high-voltage electrical crew apply a patented commercial process that allows quick repairs where welding is difficult or impossible (in this case, electrical transformers containing the insulating liquid, PCB). Use of the process increased the life of the equipment, delayed the need for costly replacement, and reduced the staff time required to monitor leaks. This results in *an annual savings of $85,000.*

Automated Institutional Loan Processing System
University of Washington

Using a minicomputer and packaged software, the University of Washington's student loans office staff developed an automated system for processing institutional loans. One-time entry of application data permits the creation of a personalized promissory note and disclosure statement, authorization lists for ordering checks and various daily, monthly, and quarterly reports, and other essential documents. The university *saves over $31,000 a year.*

Additional information on any programs that interest you may be obtained from NACUBO, ATTN: Darryl Brown or Mary Beth Campbell, One Dupont Circle, Suite 500, Washington, D.C. 20036-1178; 202-861-2518.

Other 1984 Participants

Alverno College
In-House Bookstore Operation
Elevator Service Contract
American Technological University
On-Line Student Registration
Bank Street College of Education
Using Fluorescent Lamps on Track Lighting System
Bentley College
Residence Hall Incentive Energy Conservation Program
Berea College
Reducing Dormitories' Maintenance Cost with Unskilled Labor
Reducing Cost of Goods in Print Shop
Bloomsburg University
Duty Cycling and Demand Limiting for Electricity Conservation
Boston University Medical Center
Renovating Rather than Raze Building
Bowling Green State University
Replacing Keypunch with Microcomputer System
Central Methodist College
Converting Boilers to Coal
Central Michigan University
Accelerating Collections on Current Students
Central Missouri State University
Renovation of Three Cars with over 100,000 Miles
Double Roll Toilet Tissue Dispensers
Cincinnati Technical College
Suggestion Program
Auction of Surplus and Obsolete Material
Changes in Sick Leave and Vacation Leave
Cleveland State University
Increasing the Revenues of Self-Supporting Parking
Columbia University
Replacement Lighting for Chapel
Changing Lighting in Auditorium
Converse College
Connecting Air Handling Units to the Fire Alarm System
Telephone System Rented to Students
Independent Hot Water Systems
Replacement and Renovation of Steam Burner
Replacement of Exterior and Dormitory Lighting
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College-Owned Telecom
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Iowa State University
Contracted Labor Supervised by In-House Personnel
Exclusive Arrangement with Local Travel Agency
Kearney State College
Installation of Digital Telephone System
Lawrence University
Time Clocks Control Library Lights
Long Island University, C. W. Post Campus
Electric Chillers and Summer Hot Water Boilers
Longwood College
Wood Products as Boiler Fuel
Louisiana State University
Three Phase Energy Management in Boiler System
Lutheran Theological Seminary at Philadelphia
Energy Management System
Maryville College
Wood Fired Boiler System
Medical College of Georgia
Electrical Chillers
Mercy College of Detroit
Changes in Custodial Staffing and Hours
Storm Window Retrofit
Reduction of Lighting Wattage
Receipt of Donated Rose Gardens
Energy Conservation Contest
Salvage Sale and Exchange Day
Michigan State University
Energy Consumption Data on Microcomputer
Middlesex County College
Replacement of Absorption Chiller with Centrifugal One
Millsaps College
Window Treatment
Independent A/C System for Computer
Variable Air Volume System
Chilled Water Optimizer
HVAC Economizers
Lighting for Parking and Gym Areas
Dead-Band Thermostats
Cafeteria Hood Exhaust Fitted with Direct Make-Up Air Ducts
Mississippi College
Replacement of Absorption Chillers and Mechanical System Retrofit

Mount Hood Community College
Returning HVAC Systems to Original Specifications
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Flexible Off-Campus Student Housing
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Lighting Cost Reduction
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Total Institution Involvement in Freshman Orientation
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Increased Size of Cooling Tower—Installation of Chiller Optimizer
Interconnection of Two Chiller Equipment Rooms
Roosevelt University
Modification of Controls Over Steam Valves
Saint Mary's University of San Antonio
Direct Procurement of Heating Equipment
Saint Petersburg Junior College
Admissions/Registration Project
Sangamon State University
HVAC Zone Scheduling Plan
San Mateo County Community College District
College Catalog Cost Reduction
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Student Workers Given Housing in Exchange for Project Work
Southern Baptist Theological Seminary
WATS for Outgoing Long Distance Telephone Service
Southern Utah State College
Waste Exhaust Heat Recovery System
State University of New
Automated Inventory a
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Tulane University
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University of Wisconsin-Milwaukee
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Arkansas College
Leaf Trailer with Automated Dump
Bowling Green State University
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Carnegie-Mellon University

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